AMENDMENTS

CLAIMS AMENDMENTS

1. (currently amended) A circuit, comprising:

a nonlinear transmission line circuit having an input and an output; and

a pulse-forming circuit coupled to the nonlinear transmission line, the pulse-forming circuit including a reverse-biased diode coupled in series with ~~to~~ the output of the nonlinear transmission line circuit.

2. (original) The circuit according to claim 1, further including a co-planar waveguide in which the nonlinear transmission line is disposed.

3. (original) The circuit according to claim 1, wherein the circuit is fabricated from high-resistivity silicon.

4. (original) The circuit according to claim 1, wherein the nonlinear transmission line includes a plurality of reverse-biased Schottky diodes coupled to a central conductor.

5. (original) The circuit according to claim 1, further including a gate device coupled to the pulse-forming circuit.

6. (original) The circuit according to claim 5, further including a modulator coupled to the gate and a laser coupled to the modulator for generating optical pulses.

7. (original) The circuit according to claim 6, wherein the modulator is a 10 GHz $LiNbO_3$ modulator.

8. (original) The circuit according to claim 7, wherein the circuit generates signals at a rate of at least 10 Gbit/s.

9. (original) The circuit according to claim 7, wherein the circuit generates optical pulses less than about 27 picoseconds FWHM.

10. (original) The circuit according to claim 7, wherein the gate is a dual-gate FET.

11. (original) The circuit according to claim 10, wherein the gate is a Si/SiGe heterostructure bipolar transistor.

12. (original) A data transmission system, comprising:

a nonlinear transmission line;

a pulse-forming circuit coupled to the nonlinear transmission line;

a gate coupled to the pulse-forming circuit;

an optical modulator coupled to the gate; and

a laser coupled to the modulator.

13. (original) The system according to claim 12, wherein the system is integrated on a silicon substrate.

14. (original) The system according to claim 12, wherein the gate includes a dual-gate FET.

15. (original) The system according to claim 12, wherein the pulse-forming circuit includes a reverse-biased diode.

16. (original) A method of generating optical pulses, comprising:

electrically modulating an output signal from a pulse-forming circuit coupled to a nonlinear transmission line; and

modulating an output signal from the pulse-forming circuit with a laser-generated signal to provide an optical signal.

17. (original) The method according to claim 16, wherein the pulse-forming circuit includes a reverse-biased diode coupled to the nonlinear transmission line.

18. (original) The method according to claim 16, further including inserting the nonlinear transmission line within a waveguide.

19. (original) The method according to claim 16, further including fabricating the nonlinear transmission line from high-resistivity silicon.

20. (original) The method according to claim 16, further including integrating a gate, the modulator, the laser, the nonlinear transmission line, and the pulse-forming circuit on a silicon substrate.